The Flora of Zečevo (Hvar Archipelago, Croatia)

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Summary

The islet of Zečevo belongs to Hvar Archipelago and it is situated two kilometres north-east of Vrboska on the island of Hvar (Croatia). The area of islet is protected as a Significant landscape. During vegetation periods from 2006 to 2010 a total of 216 vascular plant taxa were recorded. From those, 12 taxa were recorded for Hvar Archipelago for the first time. The taxa were classified within 65 families and 161 genera. The most abundant families are legumes (*Fabaceae* 13%), daisies (*Asteraceae* s.l. 9.2%), grasses (*Poaceae* 8.3%) and mints (*Lamiaceae* 5.1%). According to the analysis of life forms the largest portion of therophytes (45.4%) and hemicryptophytes (21.3%) were found. Phytogeographical analysis reveals predominance of the Mediterranean floral element (63.4%), followed by widespread plants (12.5%) and Euro-Asian floral element (9.7%). Five endemics and five endangered species were recorded, among them three are vulnerable (VU): *Ophrys bertolonii* Moretti, *O. sphegodes* Mill., *Salsola kali* L. and two are endangered (EN): *Glaucium flavum* Crantz and *Carex extensa* Gooden. Three rare plant species of Croatian flora: *Ophrys liburnica* Devillers et Devillers-Tersch, *Scaligeria cretica* (Mill.) Boiss. and *Narcissus serotinus* L. were found.

Key words

Zečevo, islet of Hvar, vascular flora, plant diversity, Croatia

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Introduction

The islet of Zečevo has a status of Significant landscape since 1968 (Gabelica et al. 2011). The islet is uninhabited, which excludes major anthropogenic influence on composition and dynamics of flora. Except diverse floral composition the islet is inhabited by various animals, primarily with the high population of rabbits (in Croatian "zec") from which this islet got the name after.

First floristic research of the island of Hvar was conducted in 1818 when Franjo Portenschlag-Ledermayer visited the island and explored its flora. Since then, according to Trinajstić (1993) many individual researches of flora were carried out for example: Visiani in 1842-1852, Biasoletto in 1841, Alschinger in 1861, Pittoni in 1869, Huter in 1870 and Studnička in 1890. Trinajstić (1993) incorporated all previous floristic data and a total of 1095 plant taxa was published in "Flora of the island of Hvar".

Despite numerous floristic studies from central and southern Dalmatian islands (e.g. Trinajstić, 1993, 1998; Jasprica and Kovačić, 1997; Vladović and Jukić, 1997; Kovačić et al., 2000; Vladović et al., 2001, 2002; Bogdanović and Mitić, 2003; Bogdanović et al., 2004; Milović, 2004; Jasprica et al., 2006) the flora of Zečevo islet was never investigated before. The aim of this study was to investigate floristic diversity and to compare it with other smaller islets of the Adriatic area.

Materials and methods

Study area

The islet of Zečevo is situated two kilometres north-east of town Vrboska on the island of Hvar in central Dalmatia (Fig. 1). Surface of Zečevo islet is approximately 0.11 km^2, while the coastal length is 1539 m (Duplančić Leder et al., 2004). On the islet vegetation of *Pinus halepensis* L. woods and macchias under the influence of typical Mediterranean climate is developed (Mihovilović, 1995). Field work on Zečevo islet was carried out within four vegetation seasons between 2006 and 2010 in different periods.

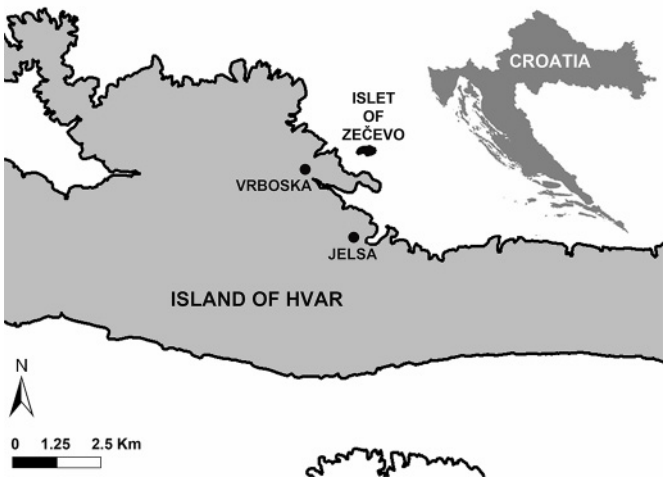

Figure 1. The geographical position of Zečevo islet

Materials and methods

The standard methods for floristic mapping of the collection and preparation of floristic materials and determination were used according to Nikolić (2006). Nomenclature has been adjusted according to the Flora Croatica Database (Nikolić, 2013a). Families, genera, species and subspecies are listed in alphabetical order and organized according to higher systematic units (Nikolić, 2013b).

The analysis of life forms was made according to Raunkiaer (1934), Horvat (1949) and Pignatti (1982). In the floristic list, life forms are marked with the following abbreviations: *Chamaephyta* (Ch), *Geophyta* (G), *Hemicryptophyta* (H), *Phanerophyta* (P) and *Therophyta* (T). The analysis of floral elements was made according to Horvatić (1963). For corresponding floral element the following abbreviations are used: (1) Mediterranean: circum Mediterranean plants – cm, east Mediterranean plants – em, Illyrian Adriatic plants – ila, Mediterranean Atlantic plants – ma, European Mediterranean plants – eum, Mediterranean Pontic plants – mp, (2) South European: south European Mediterranean plants – sem, south European Pontic plants – sep, (3) Southeast European – se, (4) European – eu, (5) Euro-Asian – ea, (6) Widespread plants – wp and (7) Alien plants – al.

Endemic (e) and invasive species (Inv) are determined according to the Flora Croatica Database (Nikolić, 2013a) and according to Boršić et al. (2008). Endangered plant species, following the abbreviations: critically endangered (CR), endangered (EN), vulnerable (VU), least concern (LC), near threatened (NT), and data deficient (DD) were determined according to Nikolić and Topić (2005) and Flora Croatica Database (Nikolić, 2013a). The new taxa for the Hvar archipelago are marked with the symbol (*) before the name of taxon in the floristic list.

Herbarium specimens are deposited in ZAGR herbarium and are accessible trough the Virtual Herbarium ZAGR according to Bogdanović (2013).

Results and discussion

During the floristic research of Zečevo islet a total of 216 vascular plant species and subspecies were found (Tab. 1), out of which 12 species are new records for Hvar Archipelago. According to taxonomical analysis, the dominant group of *Magnolianae* (168 species and subspecies) are almost four times more represented than *Lilianae* (43 species and subspecies). Researched flora includes 65 families, 161 genera, 208 species and 8 subspecies (Tab. 2). The most dominant families are *Fabaceae* with 28 species and subspecies (13%), followed by *Asteraceae* s.l. with 20 species (9.2%), *Poaceae* with 18 species and subspecies (8.3%) and *Lamiaceae* with 11 species (5.1%). Other families are represented with a smaller number of taxa. On the researched area five endangered species were found: *Ophrys bertolonii* Moretti, *O. sphegodes* Mill. and *Salsola kali* L. (VU), *Glaucium flavum* Crantz and *Carex extensa* Gooden. (EN). If the islet of Zečevo compared with other south Adriatic islands and islets, there is a high similarity with respect to plant diversity (Tab. 3). The island of Hvar covers an area of 299.7 km^2 (Rubić, 1952) and a total of 1095 species and subspecies were recorded (Trinajstić, 1993). Compared to islet of Zečevo, island of Hvar has 3000 times bigger surface, but it has five times more plant taxa. Comparative

Table 1. List of vascular flora for Zečevo islet

Taxon name	Life form	Floral element	Status
Monilophyta			
Polypodiaceae			
Asplenium ceterach L.	H	sem	
Spermatophyta			
Gymnospermae			
Cupressaceae			
Juniperus oxycedrus L.	P	cm	
Juniperus phoenicea L.	P	cm	
Pinaceae			
Pinus halepensis Mill.	P	cm	
Gnetophyta			
Ephedraceae			
Ephedra fragilis Desf. ssp. *campylopoda* (C. A. Mayer) Asch. et Graeb.	P	em	NT
Magnolianae			
Amaranthaceae			
Amaranthus albus L.	T	al	Inv
Amaranthus retroflexus L.	T	al	Inv
Anacardiaceae			
Pistacia lentiscus L.	P	cm	
Pistacia terebinthus L.	P	cm	
Apiaceae			
Bupleurum veronense Turra	T	cm	
Crithmum maritimum L.	Ch	cm	
Scaligeria cretica (Mill.) Boiss.	G	em	
Scandix pecten-veneris L.	T	cm	
Tordylium officinale L.	T	eum	
Aristolochiaceae			
**Asarum europaeum* L.	Ch	ea	
Asclepiadaceae			
Vincetoxicum hirundinaria Medik. ssp. *adriaticum* (Beck) Markgr.	H	ea	LC, e
Asteraceae			
Bellis sylvestris Cirillo	H	cm	
Carduus pycnocephalus L.	H	cm	DD
Carlina corymbosa L.	H	cm	
Crupina crupinastrum (Moris) Vis.	T	cm	
Helichrysum italicum (Roth) G.Don	Ch	cm	
Inula crithmoides L.	Ch	sem	
Senecio vulgaris L.	T	wp	
Boraginaceae			
Anchusa cretica Mill.	T	cm	
Echium parviflorum Moench	T	cm	
Heliotropium europaeum L.	T	ma	
Brassicaceae			
Alliaria petiolata (M. Bieb.) Cavara et Grande	H	wp	
Alyssum alyssoides (L.) L.	T	cm	
Aurinia sinuata (L.) Griseb.	Ch	ila	e
Calepina irregularis (Asso) Thell.	T	eu	
Capsella bursa-pastoris (L.) Medik.	H	al	Inv
Capsella rubella Reut.	T	cm	
Sinapis arvensis L.	T	cm	
Thlaspi arvense L.	T	ea	
Cactaceae			
Opuntia ficus-indica (L.) Mill.	P	al	Inv
Caprifoliaceae			
Lonicera implexa Aiton	P	cm	
Viburnum tinus L.	P	cm	
Caryophyllaceae			
Cerastium fontanum Baumg. ssp. *vulgare* (Hartman) Greuter et Burdet	H	ea	
Cerastium pumilum Curtis ssp. *glutinosum* (Fries) Jalas	T	cm	
Cerastium semidecandrum L.	T	ea	
Silene sedoides Poir.	T	cm	
Silene vulgaris (Moench) Garcke	H	sem	
Stellaria media (L.) Vill.	T	wp	
Chenopodiaceae			
Chenopodium murale L.	T	ma	DD
Salsola kali L.	T	wp	VU
Cichoriaceae			
Crepis foetida L.	T	sem	
Crepis neglecta L.	T	eum	
Crepis rubra L.	T	cm	
Hedypnois cretica (L.) Dum.Cours.	T	cm	
Hyoseris radiata L.	H	cm	
Hyoseris scabra L.	T	cm	
Leontodon taraxacoides (Vill.) Mérat	H	mp	
Reichardia picroides (L.) Roth	H	cm	
Sonchus asper (L.) Hill	T	ea	
Sonchus oleraceus L.	T	wp	
**Taraxacum laevigatum* auct. croat.	H	se	
Tragopogon porrifolius L.	H	cm	
Urospermum picroides (L.) Scop. ex F.W.Schmidt	T	cm	
Cistaceae			
Fumana thymifolia (L.) Spach ex Webb	Ch	cm	
Convolvulaceae			
Convolvulus cantabrica L.	H	cm	
Cornaceae			
**Cornus mas* L.	P	ea	
Corylaceae			
Ostrya carpinifolia Scop.	P	se	
Crassulaceae			
Sedum acre L.	Ch	eu	
Sedum rubens L.	T	se	
Cuscutaceae			
Cuscuta australis R. Br.	T	se	
Dioscoreaceae			
Tamus communis L.	G	cm	
Ericaceae			
Arbutus unedo L.	P	cm	
Erica arborea L.	P	cm	
Euphorbiaceae			
Euphorbia exigua L.	T	cm	
Euphorbia fragifera Jan	Ch	ila	
Euphorbia peploides Gouan	T	cm	
Euphorbia peplus L.	T	se	
Euphorbia spinosa L.	Ch	cm	
Mercurialis annua L.	T	wp	
Fabaceae			
Anthyllis vulneraria L. ssp. *praepropera* (A.Kern.) Bornm.	H	cm	
Astragalus muelleri Steud. et Hochst.	H	ila	NT, e
Ceratonia siliqua L.	P	cm	
Colutea arborescens L.	P	cm	
Dorycnium hirsutum (L.) Ser.	Ch	cm	
Hippocrepis ciliata Willd.	T	cm	
Lathyrus cicera L.	T	cm	
Lathyrus setifolius L.	T	cm	
Lathyrus sphaericus Retz.	T	cm	
Lotus corniculatus L.	H	wp	
Lotus cytisoides L.	Ch	cm	
Lotus edulis L.	T	cm	
Lotus ornithopodioides L.	T	cm	
Medicago littoralis Rohde ex Loisel.	T	cm	
Medicago lupulina L.	T	ea	
Medicago minima (L.) Bartal.	T	wp	
Medicago polymorpha L.	T	eum	
Melilotus sulcatus Desf.	T	cm	
Ononis ornithopodioides L.	T	cm	
Ononis reclinata L.	T	cm	
Scorpiurus muricatus L.	T	cm	
**Tetragonolobus maritimus* (L.) Roth	H	mp	
Trifolium campestre Schreber	T	wp	
Trifolium scabrum L.	T	cm	

Vicia cracca L.	H	ea	
Vicia lutea L.	T	sem	
Vicia sativa L.	T	ea	
Vicia tetrasperma (L.) Schreber	T	se	
Fagaceae			
Quercus ilex L.	P	cm	
Fumariaceae			
Fumaria capreolata L.	T	cm	
Fumaria officinalis L.	T	ea	
Fumaria parviflora Lam.	T	sem	
Gentianaceae			
Blackstonia perfoliata (L.) Huds.	T	ma	
Centaurium erythraea Rafn	H	wp	
**Centaurium tenuiflorum* (Hoffmanns. et Link) Fritsch	T	ea	
Geraniaceae			
Erodium cicutarium (L.) L'Hér.	T	wp	
Erodium malacoides (L.) L' Hér.	T	cm	
Geranium columbinum L.	T	ea	
Geranium dissectum L.	T	wp	
Geranium molle L.	T	wp	
Geranium rotundifolium L.	T	wp	
Geranium robertianum L.	T	wp	
Clusiaceae			
Hypericum perforatum L.	H	ea	
Lamiaceae			
**Ajuga genevensis* L.	H	ea	
Lamium amplexicaule L.	T	wp	
Marrubium incanum Desr.	H	cm	
Micromeria graeca (L.) Rchb.	Ch	cm	
Micromeria juliana (L.) Benth. ex Rchb.	Ch	cm	
Prasium majus L.	Ch	cm	
Rosmarinus officinalis L.	P	cm	
Sideritis romana L.	T	cm	
Teucrium polium L.	Ch	mp	
Thymus longicaulis C.Presl	Ch	ila	
Thymus serpyllum L.	Ch	eu	
Linaceae			
Linum strictum L. ssp. *corymbulosum* (Rchb.) Riony	T	cm	
Linum trigynum L.	T	cm	
Loranthaceae			
**Loranthus europaeus* Jacq.	P	ea	
Malvaceae			
Althaea hirsuta L.	T	cm	
Lavatera arborea L.	H	cm	
Malva sylvestris L.	H	ea	
Moraceae			
Ficus carica L.	P	eum	
Myrtaceae			
Myrtus communis L.	P	cm	
Oleaceae			
Fraxinus ornus L.	P	eum	
Olea europaea L.	P	cm	
Phillyrea media L.	P	cm	
Orobanchaceae			
Orobanche minor Sm.	T	sem	
Papaveraceae			
Glaucium flavum Crantz	H	cm	EN
Plantaginaceae			
Plantago afra L.	T	cm	
Plantago holosteum Scop.	H	cm	LC
Plumbaginaceae			
Limonium cancellatum (Bernh. ex Bertol.) Kuntze	H	ila	e
Limonium narbonense Mill.	H	cm	
Portulacaceae			
Portulaca oleracea L.	T	wp	
Primulaceae			
Anagallis arvensis L.	T	wp	Inv
Anagallis coerulea Schreb.	T	cm	
Ranunculaceae			
Anemone hortensis L.	G	cm	
Nigella damascena L.	T	cm	
**Ranunculus ficaria* L.	G	eu	
Resedaceae			
Reseda lutea L.	H	eu	
Reseda phyteuma L.	T	cm	
Rosaceae			
Crataegus monogyna Jacq.	P	ea	
Prunus mahaleb L.	P	sep	
Sanguisorba minor Scop. ssp. *muricata* Briq.	H	sem	
Rubiaceae			
Galium aparine L.	T	ea	
Galium corrudifolium Vill.	H	mp	
Galium lucidum All.	H	sem	
Rubia peregrina L.	P	cm	
Sherardia arvensis L.	T	wp	
Valantia muralis L.	T	cm	
Santalaceae			
Osyris alba L.	G	cm	
Saxifragaceae			
Saxifraga tridactylites L.	T	cm	
Scrpohulariaceae			
Bellardia trixago (L.) All.	T	cm	
Kickxia elatine (L.) Dumort.	T	cm	
Verbascum phoeniceum L.	H	sep	
Veronica cymbalaria Bodard	T	cm	
Solanaceae			
Solanum nigrum L.	T	wp	
Thymelaeaceae			
**Thymelaea hirsuta* (L.) Endl.	P	cm	NT
Valerianaceae			
Valerianella echinata (L.) DC.	T	cm	
Verbenaceae			
Vitex agnus-castus L.	P	cm	
Violaceae			
Viola arvensis Murray	T	wp	
Lilianae			
Amaryllidaceae			
**Narcissus tazetta* L.	G	cm	NT
**Narcissus serotinus* L.	G	cm	
Araceae			
Arisarum vulgare O.Targ.Tozz.	G	cm	
Arum italicum Mill.	G	cm	
Asparagaceae			
Asparagus acutifolius L.	G	cm	
Cyperaceae			
Carex distachya Desf.	H	cm	
Carex extensa Gooden.	H	ma	EN
Carex hallerana Asso	H	cm	
Iridaceae			
Iris germanica L.	H	wp	
Romulea bulbocodium (L.) Sebast. et Mauri	G	cm	
Liliaceae			
Allium subhirsutum L.	G	cm	
Asphodelus aestivus Brot.	G	cm	
Bellevalia dubia (Guss.) Rchb.	G	cm	
Muscari comosum (L.) Mill.	G	sem	
Muscari neglectum Guss. ex Ten.	G	cm	
Ornithogalum collinum Guss.	G	cm	
Ornithogalum comosum L.	G	mp	
Ornithogalum umbellatum L.	G	sem	
Scilla autumnalis L.	G	mp	
Smilax aspera L.	G	cm	
Orhidaceae			
Limodorum abortivum (L.) Sw.	G	cm	
Ophrys bertolonii Moretti	G	sem	VU
Ophrys liburnica Devillers et Devillers-Tersch.	G	ila	e

Ophrys sphegodes Mill.	G	cm	VU
Serapias parviflora Parl.	G	cm	
Poaceae			
Anthoxanthum odoratum L.	H	ea	
Avena barbata Pott ex Link	T	ma	
Brachypodium retusum (Pers.) P.Beauv.	H	cm	
Briza maxima L.	T	wp	
Bromus hordeaceus L.	T	wp	
Bromus madritensis L.	T	ma	
**Catapodium pauciflorum* (Merino) Brullo, Giusso, Miniss. & Spamp.	T	cm	
Cynodon dactylon (L.) Pers.	G	wp	
Dactylis glomerata L.	H	wp	
Desmazeria rigida (L.) Tutin	T	ma	
Heteropogon contortus (L.) P.Beauv. ex Roem. et Schult.	H	cm	NT
Hordeum murinum L. ssp. *leporinum* (Link) Arcang.	T	cm	
Koeleria splendens C.Presl	H	sem	
Lagurus ovatus L.	T	cm	
Lolium rigidum Gaudin	T	sem	
Lophochloa cristata (L.) Hyl.	T	ea	
Melica ciliata L.	H	cm	
Poa bulbosa L.	H	wp	

Table 2. Taxonomical analysis of the flora of Zečevo islet

Taxon	*Monoliophyta*	*Gymnospermae*	*Angiospermae*		Σ
			Magnolianae	*Lilianae*	
Family	1	3	54	7	65
Genus	1	3	123	34	161
Species	1	3	162	42	208
Subspecies	0	1	6	1	8
Species and subspecies (%)	0.5	1.9	77.8	19.9	100.0

Table 3. Number of taxa and area size of the islet of Zečevo (Hvar) and some middle and south Adriatic islands and islets (1, 3, 4, 6: Regula-Bevilacqua and Ilijanić, 1984; 2: Trinajstić, 1993; Nikolić, 2013a; 5: Bogdanović et al., 2004; 7: Milović, 2004; 8: Vladović et al. 2001; 9: present study; 10: Jasprica et al., 2006; 11: Pavletić, 1983)

Island	Area (km^2)	Number of species and subspecies
1. Brač	394.57	750
2. Hvar	299.70	1224 (with new data)
3. Korčula	276.00	850
4. Vis	90.30	800
5. Biševo	5.80	421
6. Svetac	5.10	344
7. Obonjan (Šibenik)	0.70	230
8. Vela Kluda (Trogir)	0.12	137
9. Zečevo (Hvar)	0.11	216
10. Sv. Andrija (Dubrovnik)	0.05	160
11. Brusnik	0.04	41

analysis between Zečevo and Hvar archipelago (Trinajstić, 1993; Nikolić, 2013a) results in identification of 12 new species (5.6% of the total flora registered on Zečevo islet) that have not been found on the island of Hvar before.

Analysis of life forms shows a high ratio of therophytes (45.4%) and hemicryptophytes (21.3%) (Fig. 2). The therophytes dominance indicates influence of typical Mediterranean climate on the islet. The high percentage of geophytes (12.5%) indicates floristically rich spring aspect of the flora of Zečevo islet. It is important to note that among the geophytes there are some vulnerable (VU) plant species as: *Ophrys bertolonii* Moretti and *Ophrys sphegodes* Mill. and near threatened (NT) like *Narcissus tazetta* L. The spectrum of life forms of Zečevo islet coincides with the spectra of some similar size area islands and islets of central and southern Adriatic as well as with the spectrum of the Mediterranean in general (Tab. 4). Compared with spectrum of the Mediterranean in general (Horvat, 1949), there is some larger proportion of therophytes and smaller proportion of hemicryptophytes in the spectrum of Zečevo. A slightly larger proportion of therophytes is probably because the islet of Zečevo has a lot of open grassland habitats.

Phytogeographical analysis (Fig. 3) showed prevalent of Mediterranean floral element (138 species and subspecies, 63.4%) of which the most of circum Mediterranean plants (111 species and subspecies, 51.4%) followed by widespread plants represented by 27 species (12.5%) and plants of Euro-Asian floral element with 21 species and subspecies (9.7%). Other floral elements were represented by smaller number. Significant presence of Mediterranean floral element indicates that Zečevo islet belongs to the corresponding Mediterranean region (cf. Horvatić, 1963)

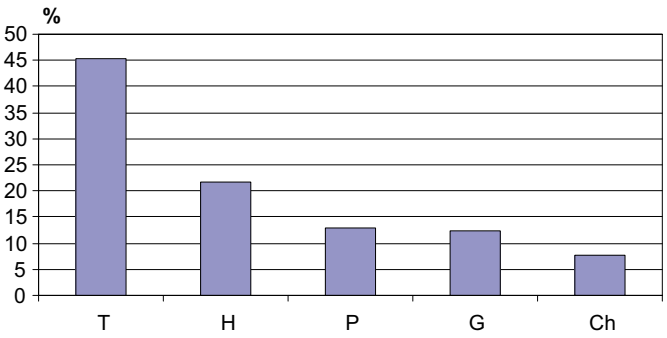

Figure 2. Analysis of life forms on Zečevo islet (T – Therophyta, H – Hemicryptophyta, P - Phanerophyta, G – Geophyta and Ch – Chamaephyta)

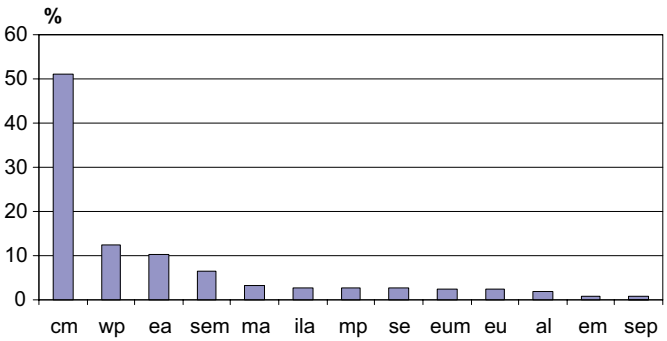

Figure 3. Analysis of floral elements in the flora of Zečevo islet

Table 4. Comparative survey of life forms of Zečevo islet and similar size area middle and south Adriatic islands, islets and the Mediterranean (%)

Area	T (%)	H (%)	P (%)	Ch (%)	G (%)	Literature source
Obonjan	47	19.1	11.7	11.7	10.4	Milović, 2004
Vela Kluda	45.3	21.2	13.1	8.8	11.6	Vladović et al., 2001
Zečevo	45.4	21.3	13	7.9	12.5	present study
Sv. Andrija	36.4	25.3	18.2	13	6.5	Jasprica et al., 2006
Mediterranean	42	29	12	6	11	Horvat, 1949

Table 5. Comparative survey of the prevalent floral elements of Zečevo islet and some other similar size areas of Adriatic islets (%)

Area	Mediterranean	South European	Euro-Asian	Widespread plants	Alien	Literature source
Obonjan	53	20.4	3.9	16.1	3	Milović, 2004
Vela Kluda	63.5	17.5	3	13.8	1.5	Vladović et al., 2001
Zečevo	63.4	7.4	9.7	12.5	1.9	present study
Sv. Andrija	46.2	15.8	6.3	18.4	11.4	Jasprica et al., 2006

Figure 4. *Ophrys liburnica* Devillers et Devillers-Tersch (photo: M. Skelin)

Figure 5. *Narcissus serotinus* L. (photo: M. Skelin)

as expected. Share of Mediterranean floral element of Zečevo corresponds to the islets of similar size in central and southern Adriatic (Tab. 5). In contrast wider variations in the share of South European and Euro-Asian floral element were established. Smaller proportion of alien taxa can be explained by low anthropogenic influence on the islet, although a portion of ruderal and nitrophilous plants (as widespread plants) are high because of the presence of seagulls and rabbits on the islet. Within the group of the Illyrian-Adriatic endemic plants five taxa were recorded: *Vincetoxicum hirundinaria* Medik. ssp. *adriaticum* (Beck) Markgr., *Aurinia sinuata* (L.) Griseb., *Limonium cancellatum* (Bernh. ex Bertol.) Kuntze., *Astragalus muelleri* Steud. et Hochst. and *Ophrys liburnica* Devillers et Devillers-Tersch.

The flora of Zečevo islet is particularly valuable because of the presence of three rare plant species (*Ophrys liburnica* Devillers et Devillers-Tersch, *Scaligeria cretica* (Mill.) Boiss. and *Narcissus serotinus* L.) of the Croatian flora. New localities of these species are important in chorological point of view as the distribution area for these species is expanded outside known localities. Few individuals of stenoendemical orchid *Ophrys liburnica* Devillers et Devillers-Tersch (Fig. 4) were found in the *Pinus halepensis* wood. This species was known from Istria, Quarner Archipelago (Devillers and Devillers-Terschuren, 2004) from Korčula, Pelješac peninsula, Hvar and some costal parts of central Dalmatia area of Šibenik and Split (Delforge 2006). *Scaligeria cretica* (Mill.) Boiss. as a representative of *Apiaceae* has white flowers grouped in umbels and can often be confused with other similar taxa of this family. So far, this taxon has been recorded for some central and southern Adriatic islands and islets: Svetac, Vis, Brač, Hvar, Šćedro and in Molunat (Konavle area) (Visiani, 1852; Horvatić,

1970; Hodak, 1971; Pavletić, 1978; Trinajstić, 1993). The finding of *S. cretica* on Zečevo islet is expected due to relative vicinity of the island of Hvar, where this species is common (Trinajstić, 1993). As an autumn flowering species of daffodil, *Narcissus serotinus* L. (Fig. 5) is often omitted from floristic lists of some areas of Croatian territory. According to the latest overview of its distribution in Croatia *N. serotinus* is present on Ugljan, Promina, Knin area (Devetak, 2000), Lastovo, Pelješac peninsula and Prevlaka in Konavle region (Nikolić, 2013a).

Conclusion

In vegetation period form 2006 to 2010 flora mapping of Zečevo islet was performed and the total number of 216 vascular plant species and subspecies were recorded, while 12 species were recorded as a new for the Hvar archipelago. Prevalent of Mediterranean floral element and therophytes dominance indicates influence of typical Mediterranean climate on the islet. Compared with other middle and south Adriatic islands, the island of Hvar has the highest number of vascular plant species. Given that, on the islet of Zečevo was found several rare and endemic plant species.

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